

ZoomAir Owner's Manual

Installation Instructions for

- ✓ ZoomAir Card
- ✓ ZoomAir Software Access Point
- ✓ ZoomAir PCI Adapter

IEEE 802.11b High Rate Standard
(11 Mbps)

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**The Standard for
Wireless Fidelity.**

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Introduction

The 11 Mbps ZoomAir™ Cards are WiFi™ certified and allow you to connect two or more Windows® computers without wires. A ZoomAir Card on each computer is all you need for sharing printers and files.

If you have also purchased the 11 Mbps ZoomAir Access Point Software, you gain greater security and access control and easy connection to an existing wired LAN. Used in conjunction with the ZoomAir Cards, the ZoomAir Access Point Software serves as a bridge between the wired and wireless portions of a LAN.

This Manual provides a brief overview of wireless LANs and tells you how to install the 11 Mbit ZoomAir Cards and ZoomAir Access Point Software on your computers.

Tip: Zoom also offers a line of Hardware Access Points. Contact your dealer or reseller for more details.

Wired vs. Wireless LANs

A LAN (Local Area Network) is a network of computers connected to each other. Only the computers connected to the network can communicate and share files and printing. Each computer requires a Network Interface Card, or NIC.

Like wired LANs, wireless connections between computers have been around for some time. In addition to a NIC, each computer is fitted with a transceiver (combination transmitter and receiver) that sends data as radio or infrared signals.

Until recently, wireless LAN products have often been too expensive for use in a home or small-to-medium office. Moreover, most wireless systems were proprietary; once you made your choice, you

were limited to one vendor. The ZoomAir Card adheres to the IEEE 802.11b specification to ensure interoperability with other 802.11b wireless LAN systems.

Why Wireless?

With a wireless LAN product such as ZoomAir, you no longer have to choose between the inconvenience and expense of running wires and the expense of older, nonstandard wireless devices. Also, if users in your home or office have laptop computers, a wireless LAN preserves the mobility that laptops are meant to provide.

Wireless technology offers a level of flexibility unobtainable with wired LANs. Computers can be added to the system without additional wiring. Computers can be moved from room to room without changing the wiring. Laptop users can move through an office and be instantly connected to the company LAN (wired or wireless) without looking for a network jack.

A wireless LAN may connect all computers to each other, or it may be set up to use one of the computers as a “hub” for better control of the network.

The first arrangement is called an ad hoc, or peer-to-peer, network. It is ideal for connecting computers for home use and in small offices. In this Manual, we will use the term ad hoc.

The second arrangement is called an infrastructure, or access point, network. All computers on the network communicate through an access point. The Access Point Software can be used to create an infrastructure wireless-only LAN for better access control and security and to extend the range of the LAN.

The ZoomAir Access Point Software is also ideal for integrating a wireless LAN with an existing wired LAN. With one or more access points on a wired LAN, mobile units (typically laptops) can “roam” throughout the LAN and remain connected to it.

How Does ZoomAir Work?

The radio transmitter in the ZoomAir Card sends a radio signal in the 2.4 GHz (gigahertz, or billion-cycles-per-second) part of the radio spectrum. This is one of the “ISM” (Industrial, Scientific, Medical) bands reserved for general use and doesn’t require a li-

cense to use. (For instance, most cordless phones also operate in a different ISM band.) When a computer adds data to this radio signal, it modifies, or “modulates” the signal, changing the pattern of its frequencies. The receiver of the radio signal extracts the data from the signal and sends it to the receiving computer.

The ZoomAir product uses Direct Sequence Spread Spectrum (DSSS) technology to conserve power, reject interference from other radio signals, and provide data security. With DSSS, each bit of data is spread out over a fairly wide frequency band containing a pattern of frequencies that is detected at the receiving end and converted back into data. The frequency pattern changes constantly, with the patterns being coordinated at the sending and receiving ends. To a receiver that is not 802.11b DSSS capable, the signal resembles low-level noise.

Is my Network Secure?

Because each member of your network must be identified with the name of your network (called a Service Set Identifier, or SSID), outsiders cannot access your network without knowing the name. If you enable WEP (Wired Equivalent Privacy, a software utility included with all ZoomAir products), your network is even more secure—as secure as a wired network. Wireless LANs with a software or hardware access point can actually be more secure than wired LANs (with additional layers of security, including encryption, using commercially available software).

Keep in mind also that the ZoomAir products are fairly low-powered, with a typical range of 300 feet (about 90 meters). Under most circumstances, potential eavesdroppers will not even be aware of your network.

Is Interference a Problem?

Interference from neighboring wireless LANs should not be a problem. Your own network operates on a frequency channel much like a cellular phone. If a close neighbor also has a wireless LAN, there will be interference only if you operate on the same or an adjacent channel and the range of the wireless devices overlaps. (Interference is experienced as a slowing of network response; neighboring LANs will not have access to each other's files unless

they share both a channel and an SSID—an unlikely occurrence.) You can even establish two independent wireless LANs in the same office—ad hoc or infrastructure—with no noticeable performance degradation.

Microwave ovens operate in the 2.4 GHz range, but most are sealed fairly well. Any leakage of radio energy in this range falls off very rapidly as one moves away from the oven. Your ZoomAir Card is designed to reject microwave interference. In the worst case, a microwave oven may theoretically slow data transmission; in actual tests, the effect has been found to be minimal. You would practically have to put your computer on top of a microwave oven for you to notice a difference in data rate.

How Do I Connect to My Wired LAN?

Your ZoomAir wireless network can be easily connected to a wired LAN using an access point. The ZoomAir Access Point Software lets you use one of the PCs already on your wired LAN as an access point. Simply install the ZoomAir Card and the Access Point Software, and the wired and wireless members of your LAN work seamlessly together. Using a computer as an access point should have little, if any, noticeable effect on the computer's performance. ZoomAir also includes SyGate™ software, a program that allows one computer on your network to share Internet access with the rest of your LAN.

What Do I Need to Install a Wireless LAN?

For any wireless network, you need a ZoomAir Card for *each* computer on the network. You also need to install the accompanying software on each computer. For an infrastructure network, you need the ZoomAir Access Point Software in addition to the client software.

If you have this manual, you have purchased one of the following ZoomAir products.

ZoomAir Card

In addition to this manual, the ZoomAir Card package includes the following items:

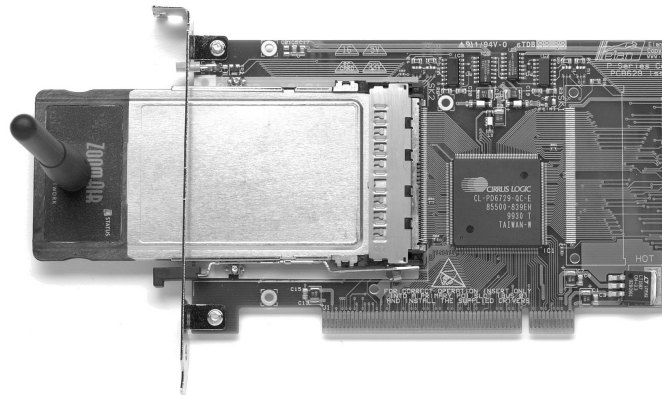
- The ZoomAir Card—a Type II PCMCIA card, including radio components and an integrated antenna.
- ZoomAir CD.
- SyGate software for shared Internet access (on ZoomAir CD).

ZoomAir Card with PCI Adapter

In addition to this manual, this package includes the following items:

- The ZoomAir Card—a Type II PCMCIA card, including radio components and an external dipole antenna.
- An 18-inch (0.5 meter) extension cable for use with the Card and antenna.
- A PCI Adapter circuit board that fits into a computer's PCI slot and allows you to use your ZoomAir Card in a desktop computer.

A representative picture of the ZoomAir Card plugged into the PCI Adapter board is shown below.



- ZoomAir CD.
- SyGate software for shared Internet access (on ZoomAir CD).

Note: For information on antenna options and complete installation instructions, please refer to the **ZoomAir Antenna Options and Installation Instructions** flyer in your ZoomAir box.

ZoomAir Access Point Software

In addition to this manual, the ZoomAir Access Point Software package includes the following items:

- ZoomAir Access Point Software on the ZoomAir CD.
- SyGate software for shared Internet access (on ZoomAir CD).
- ZoomAir Access Point Key diskette.

Note: Each access point must be identified uniquely on the network. This identification data is included on the **ZoomAir Access Point Key** diskette. This Key diskette is unique for each package. Thus, you need to purchase individual ZoomAir Access Point Software packages for each access point on your network to prevent networking problems.

Computers on Your Network

You also need the following for each computer on your wireless network:

- A 486 or Pentium® processor or equivalent running Windows 95/98; or a Pentium 120 or faster running NT 4.0 with Service Pack 4 or above, or a Pentium 133 or faster (with 64 MB of memory) running Windows 2000.
- At least 8 MB of memory.
- A hard drive with at least 5 MB free.
- A PCMCIA Type II or Toshiba PC Card slot; standard on laptop computers and optional on desktop computers with the addition of a Zoom PCI adapter.
- For the computer serving as an access point to a wired network, we recommend a minimum of a Pentium II and 32 MB of RAM.

You may also need the Windows installation CD-ROM disc that came with each computer. Note that this disc may be different for each computer on the network due to variations in operating systems and the release dates of the CDs.

Shared Internet Access

If you want to share Internet access on one of your computers, that computer will need the following:

- An established Internet connection using appropriate software and a 56K modem, ISDN terminal adapter, cable modem with adapter, or xDSL device.
- Internet gateway software, such as SyGate. We include the SyGate software with the ZoomAir Access Point Software and the ZoomAir Card. For additional details about SyGate, visit www.zoom.com/bnp/zoomair/sygate.shtml.

Installation Preview

These are the major steps in installing the ZoomAir Wireless LAN on each computer in your network:

Chapter 1: Planning Your Wireless Network. This chapter guides you through a site survey to determine the best placement of your wireless LAN computers.

Chapter 2: Installing the ZoomAir Wireless Card. The ZoomAir Card simply plugs into the PCMCIA slot on the computer. An installation wizard then takes you through an easy setup process. Separate sections cover Windows 95/98, NT 4.0, and Windows 2000.

Chapter 3: Sharing Printers and Files. Each client computer on your wireless network can share its printer and any of the files on its hard drive. This chapter guides you through the process.

Chapter 4: Changing Security Settings. You can increase the security of your wireless network by giving it a unique SSID and by implementing Wired Equivalent Privacy software, which encrypts data transferred over the wireless LAN. This chapter explains how.

Chapter 5: Advanced Settings. We've included a powerful Configuration Utility that allows you to customize and manage your wireless LAN. This chapter walks you through the configuration utility options.

Appendix A: For Desktop Users Only: Installing the PCI Adapter. Refer to this chapter if you have purchased the ZoomAir model with PCI Adapter option and want to install ZoomAir on your desktop computer.

Appendix B: Answer File Installation Instructions. If you are installing a large wireless network, you have the option of creating an answer file that automates the installation and minimizes the need for user input. This appendix tells you how.

Appendix C: Troubleshooting. Refer to this appendix for troubleshooting advice.

Appendix D: Regulatory Information. This appendix gives information about ZoomAir's compliance with governmental regulations.

Tip: Zoom frequently offers free downloads and upgrades on our web site, so be sure to visit **www.zoom.com** periodically.

1

Planning Your Wireless Network

The installation of any new computer hardware or software is more likely to be successful with a little planning. This chapter covers the following types of setups:

- Ad Hoc Network
- Infrastructure All-Wireless Network with an Access Point
- Infrastructure Network with an Access Point to a Wired LAN

Ad Hoc Network

If you are setting up an all-wireless ad hoc network in a home or small office, there is not much planning to do. You probably already know which computer has a printer that you want to share, and which computers have files that the other members of the network should have access to. Without an access point, each client computer should be within 300 feet (92 meters) in a typical partitioned office environment. This figure may be lower depending on the thickness and composition of the walls and floors of the building. In most homes and small offices, you would find it difficult to separate the client computers by more than 75 to 100 feet (about 25 to 30 meters)—you’d simply run out of building!

In large structures with no barriers, or outdoors, the range is greater—typically 455 to 690 feet (140 to 210 meters).

Infrastructure All-Wireless Network

An infrastructure wireless network with a centrally located access point can double the range of an all-wireless network. You might find an access point useful, for instance, in a large, L-shaped office with thick, steel-reinforced walls.

Note: At the time this Manual was written, wireless bridging between Access Points was not supported for all-wireless networks.

Infrastructure Network with an Access Point to a Wired LAN

If you are installing an infrastructure wireless network to connect to a wired LAN, you will need one access point for each 100 to 360 linear feet (about 30 to 110 meters) in a typical indoor partitioned office environment. This translates to one access point for approximately each 7,200 to 94,000 square feet (about 650 to 8,800 square meters). In large structures with no barriers, or outdoors, the range may be as great as 690 feet (about 210 meters).

Note: You are not limited to one floor. A ZoomAir wireless network can operate between floors, with effective distances dependent on the composition of the floors and ceilings.

Because of the great flexibility of wireless networks, you can add new members (and new access points to a wired network) at any time.

Strategy

There are at least two procedures you can follow for installing an infrastructure network. Either will work well, but it is best to start with a plan.

All Clients First

Install all your ZoomAir Cards as ad hoc clients, accepting the defaults in the setup software. This will give you a functioning ad hoc wireless network, which you can test and troubleshoot before joining it to the wired network. When you are satisfied with this ad hoc network, you can “promote” the client you have designated to be an access point simply by uninstalling its drivers and installing the access point drivers. At that point you can also use the configuration software to add extra security features if you want to. Then you can change each of the remaining clients from ad hoc to infrastructure mode and add matching security features.

The advantage of this plan is that you install the simplest ad hoc network first and troubleshoot it. It also makes the most sense if you have been operating an ad hoc wireless network for a while and want to join it to a wired network later.

Access Point(s) First

Install your access point(s) first. As you complete each access point installation, you can modify the settings to increase security. Then install the clients, modifying each one as you go to match any special security settings of the access point(s).

The advantage of this plan is that you need to visit each access point and client only once.

Site Survey

For the initial setup of either an ad hoc or an infrastructure wireless network, you may want to conduct a site survey. For a home or small office, this could be a simple walk-through, perhaps with a measuring tape, to determine the distances between potential members of your network.

For a larger office you may want to do a more formal survey, as follows:

1. Install ZoomAir Cards on two laptop computers and configure them for ad hoc operation.
2. Establish a connection between the computers (sharing a file folder, for instance).
3. Move the computers around in your work area to typical locations for network members—especially to the locations that are farthest apart. As you do so, attempt some file transfers and monitor the connection to be sure it is maintained.
4. If you cannot maintain a reliable wireless connection at the extremes of your work area (ad hoc) or at the farthest point from your proposed access point (infrastructure), your options are to relocate the network members, relocate the access point, or add another access point.

Another consideration to keep in mind for both ad hoc and infrastructure networks is that you may want to keep one or more computers in a fixed location and running all the time:

- Any computer with a resource that must be regularly shared, such as a printer, a drive or file folder, or a modem.
- The computer that serves as an access point to the wired LAN.

For less formal situations—at home or in a small office—computers on the wireless LAN can be turned on and off as needed.

2

Installing the ZoomAir Card

The first stage of installing ZoomAir is to install the Card itself. Installing the ZoomAir card is the same, no matter which operating system your computer is running. The second stage is to install the software. These instructions vary, depending on your operating system. Make sure to follow the instructions for your computer's operating system.

*If you want to use your ZoomAir Card on your desktop computer, rather than your laptop, please first turn to **Appendix A** on page 47 for instructions on how to install the Adapter. Then return to this section to install ZoomAir.*

Inserting the ZoomAir Card

- 1 Make sure the computer is turned off.
Write down the card's serial number in the **Important Information Table** on the last page of this manual. Also write down the MAC (Media Access Control) address, located on the bottom label. You may not need this in an ad hoc network, but it is a good idea to have it recorded for future reference. The MAC address is a unique identifier and is different for each network card.

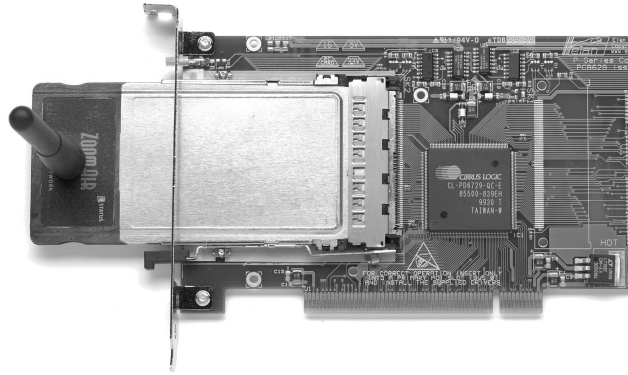
- 2 Insert the ZoomAir Card into the PC Card slot.

Important: If you are a desktop user with a ZoomAir Card and PCI adapter board, be sure to insert the ZoomAir Card with the ZoomAir logo facing **down**.

If you are a laptop user, insert the Card with the ZoomAir logo facing **up**.

The card should slide in easily most of the way, offering slight resistance as the pins are engaged. Don't force it.

A representative picture of the ZoomAir Card inserted into a desktop computer's PCI Adapter board appears below.



Note: If you're using the ZoomAir Card with the PCI Adapter and want to use the included extension cable, please refer to the **ZoomAir Antenna Options and Installation Instructions** flyer in your ZoomAir box for directions.

Installing the ZoomAir Drivers: Windows 95/98/2000 Only

If you are using Windows NT, skip ahead to the **Installing the ZoomAir Software** section on page 20.

If you are using Windows 95, 98, or 2000, you need to install the ZoomAir drivers *before* you install the ZoomAir software. Follow these steps:

- 1 With the ZoomAir Card inserted, turn on the computer. A dialog box will appear stating that new hardware has been found. The box may say that the wizard searches for new drivers for Texas Instruments PCI1410; if it does, just click **Next**.

Insert the ZoomAir CD in the CD-ROM drive. Click **OK** or **Next**.

- 2 You may be asked, **What do you want Windows to do?**

Make sure to select **Search for best driver**. Click **OK** or **Next**.

- 3** Check the **Specify a location** box.

If you are using Windows 95/98:

And are installing an Access Point: In the list box, type **d:\ap** (where **d** is the letter of your CD-ROM drive) and click **Next** or **OK**.

And are installing a Client: In the list box, type **d:\client** (where **d** is the letter of your CD-ROM drive) and click **Next** or **OK**.

If you are using Windows 2000:

And are installing an Access Point: In the list box, type **d:\ap\setup** (where **d** is the letter of your CD-ROM drive) and click **Next** or **OK**.

And are installing a Client: In the list box, type **d:\client\setup** (where **d** is the letter of your CD-ROM drive) and click **Next** or **OK**.

- 4** The Installation Wizard will find the drivers located on the CD. Click **OK** or **Next**.
- 5** The Wizard may ask you for a Windows installation diskette or CD. If so, insert it and type in its location. Be sure to use the Windows installation software that came with this particular computer. Click **OK**.

Windows 95 Users, Take Note:

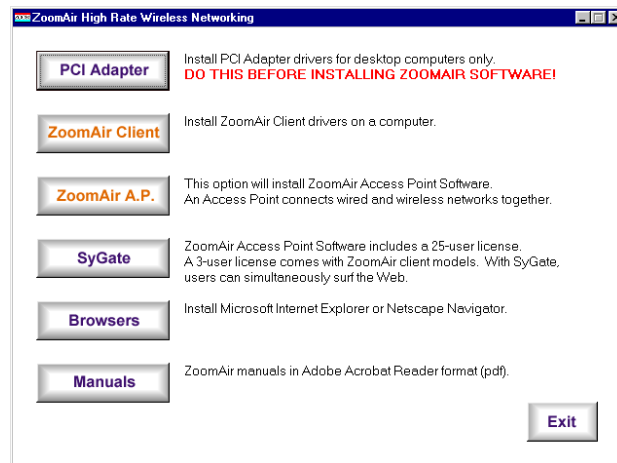
If you are asked for any files with an **.inf** or **.sys** extension, you must remove the Windows CD and insert the ZoomAir CD; otherwise, the installation will not proceed successfully.

- 6** A **Network Properties** dialog box may appear, prompting you for Computer and Workgroup information. The Computer name should be unique; typically the Workgroup name is the same for everyone on the LAN.
- 7** Click **Close** or **Finish** when prompted. Restart your computer (and re-insert the ZoomAir CD if you removed it in Step 5).

Installing the ZoomAir Software

If you haven't already restarted your computer, do so now. Then follow these steps to install the ZoomAir software.

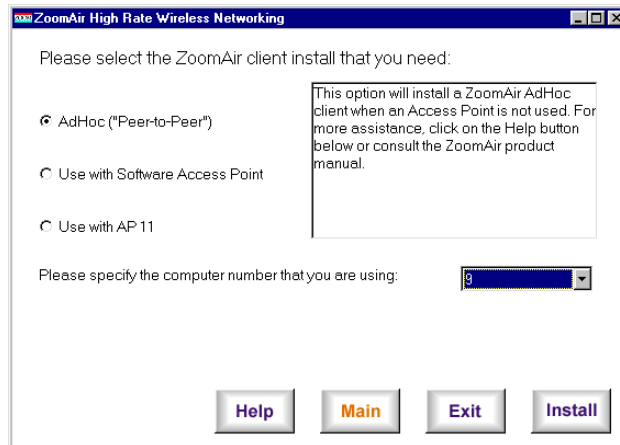
- 1 Click on **Start | Run** and type **d:\setup.exe**, where **d** is the letter of your CD-ROM drive, and click **OK** or **Next**.
- 2 The **ZoomAir High Rate Wireless Networking** dialog box will display. Select the setup of your choice by clicking on the appropriate button: **ZoomAir Client** or **ZoomAir A.P.**



- 3 *If you are installing a ZoomAir Client:*
You need to select the appropriate configuration. Your choices are **AdHoc**, **Use with Software Access Point**, or **Use with AP11**.

The AP11 is a hardware access point. It is a recent addition to the ZoomAir product family and is sold separately. Contact your dealer or reseller for details.

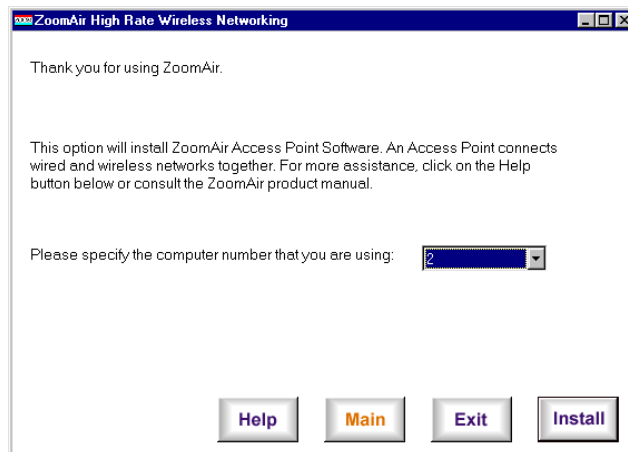
Then you need to specify the computer number you are using, for example, 9. If you need assistance making your selection, click the **Help** button on screen. Click **Install**.



A **Welcome** dialog box will display. Click **Next**.

If you are installing ZoomAir Access Point software:

You need to specify the computer number you are using; for example, 2. If you need assistance making your selection, click the **Help** button on screen. Click **Install**.



A **Welcome** dialog box will display. Click **Next**.

When prompted, insert the **ZoomAir Access Point Key** diskette into the computer's floppy drive and click **OK**.

The **Select Ethernet Adapter** dialog box will display. Select the network card (Ethernet adapter) that is connected to the

wired portion of the LAN (if any) and click **OK** or **Next**.

- 4** You may be asked for a Windows installation diskette or CD. If so, insert it, type in its location and click **OK** or **Next**.

If you are using **Windows NT**:

A **TCP/IP Setup** dialog box will display. You will be asked, Do you wish to use DHCP?

Click **Yes**, unless your network administrator has instructed you otherwise.

Upon completion, make sure to re-insert the ZoomAir CD and wait a few seconds for the computer to recognize it.

- 5** Depending on your configuration, you may see other screens. Ignore them: They will appear and disappear on their own as the installation proceeds. Click **Finish** and restart your computer when prompted.

Adding Protocols and Setting IP Addresses

Depending on your network setup, you may want to add a protocol or set an IP address. If you do want to perform these tasks, follow the steps below for your particular computer's operating system: **Windows 95/98**, **Windows NT 4.0**, or **Windows 2000**.

Windows 95/98

Adding a Protocol

- 1** Click on **Start | Settings | Control Panel**. Double-click on **Network**.

Click **Add** and select **Protocol** from the list of components.

Click **Add** and select **Microsoft** from the list of manufacturers. Click on **NetBEUI** or **TCP/IP** and then click **OK**.

TCP/IP may already be listed in the **Network** dialog box.

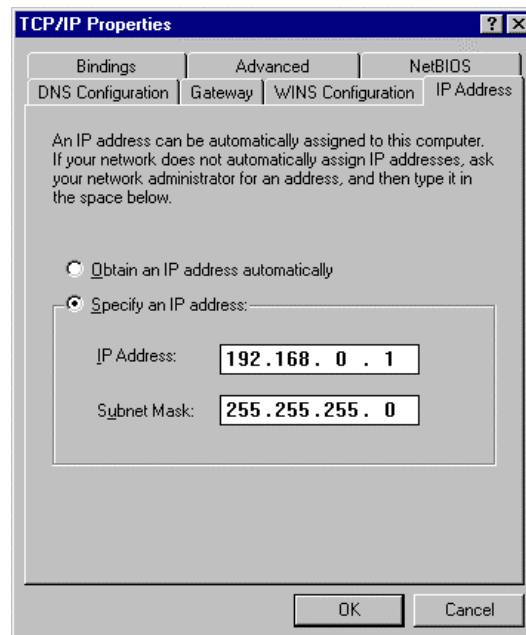
Note: Even if you are installing an ad-hoc network, you shouldn't remove TCP/IP. It may be needed for an Internet connection, for instance, and it won't hurt anything to keep it.

- 2** The **Network Properties** dialog box will display. Change the **Primary Network Logon** to **Client for Microsoft Networks** if it is not already set.

If you want to add an IP address, continue below. Otherwise click **OK** and restart your computer when you are prompted to do so.

Setting an IP Address

- 1 In the **Network Properties** dialog box, click on the entry for TCP/IP -> Zoom Telephonics 802.11 - PCMCIA Adapter.
- 2 Click on **Properties** and then on the **IP Address** tab if it isn't already selected. See the following illustration.



- 3 Click on **Specify an IP Address** and then enter the **IP Address** and **Subnet Mask**. Note that the first three groups of numbers for the IP Address must be the same for every member of the network and that the final number (1 through 253) must be unique for each member. For the Subnet Mask, use the same number for all members. Click **OK** and close the **Network Properties** dialog box.
- 4 Restart your computer when you are prompted to do so.

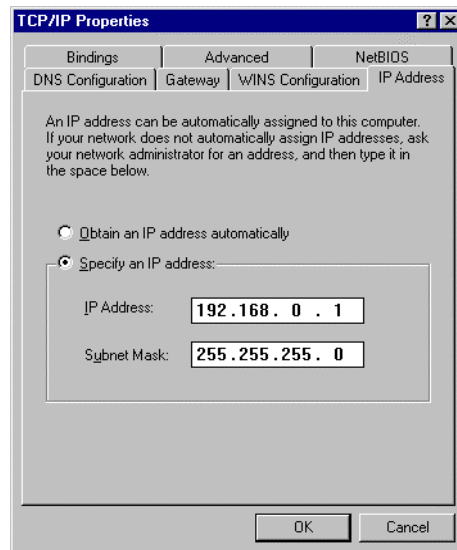
Windows NT 4.0

Adding a Protocol

- 1 Click on **Start | Settings | Control Panel**. Double-click on **Network**.
- 2 Click on the **Protocols** tab. Click **Add** and click on the protocol you need (e.g., NetBEUI Protocol); then click **OK**.
- 3 You may be prompted for your Windows CD at this point. If so, insert the CD into your CD-ROM drive.
- 4 You'll be returned to the **Network** dialog box, where you'll see the protocol that you just added.
- 5 If you want to add an IP address, continue below. Otherwise, click **Close** and restart your computer when you are prompted to do so.

Setting an IP Address

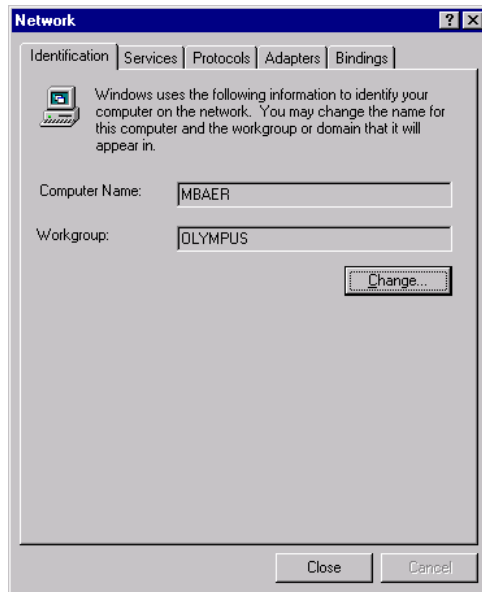
- 1 In the **Network Properties** dialog box, click on the entry for TCP/IP -> Zoom Telephonics 802.11 - PCMCIA Adapter.
- 2 Click on **Properties** and then on the **IP Address** tab if it isn't already selected.



- 3 Click on **Specify an IP Address** and then enter the **IP Address** and **Subnet Mask**. Note that the first three groups of

numbers for the IP Address must be the same for every member of the network and that the final number (1 through 253) must be unique for each member. For the Subnet Mask, use the same number for all members.
Click **OK**.

Next you should return to the **Network** dialog box and click on the **Identification** tab.



If **Computer Name** and **Workgroup** are not already entered, click on the **Change** button and type in the information.

Click **OK** to return to the **Network** dialog box and then click **Close**. Windows will install the configuration as you've specified it here. If you are using TCP/IP as one of the protocols, you may see a dialog box for setting up TCP/IP protocol properties, so you can verify your settings.

Windows 2000

Adding a Protocol

- 1 Click on **Start | Settings | Network and Dial-up Connections**. Right-click on **Local Area Connection** and select **Properties**. Click on the **Install** button.
- 2 Select **Protocol** and click **Add**.
- 3 Select the Protocol you wish to install and click **OK**.
- 4 Click **OK** to exit the **Local Area Connection Properties** dialog box. Restart your computer when you are prompted to do so.

Adding an IP Address

- 1 Click on **Start | Settings | Network and Dial-up Connections**. Right-click on **Local Area Connection** and select **Properties**. Click on the **Install** button.
- 2 Select the **Internet Protocol TCP/IP** option and click **Properties**.
- 3 Select the **Use the following IP address** radio button and enter the IP address as given to you by your network administrator. Click **OK**.
- 4 Click **OK** to exit the **Local Area Connection Properties** dialog box. Restart your computer when you are prompted to do so.

Completing the Installation



After you restart the computer, you should see an icon for the ZoomAir Card in the system tray (at the right-hand end of the taskbar). The icon may take several seconds to appear; it resembles a small computer monitor. If this is the first ZoomAir Card you have installed, the icon will be red.

Repeat this installation for the second ZoomAir Card. If you have accepted the default settings, the two cards should begin to com-

municate. You can verify this because the monitor icon in the system tray will turn green. (The change in color may take several seconds.)

As you add each new ZoomAir Card to a computer, it should join the wireless LAN and display a green icon in its system tray.

The ZoomAir Indicator Light

The ZoomAir Card has one green indicator light that monitors the network connection. If the light is solid green, the Card is either in ad hoc mode, or it has joined an access point in an infrastructure network. If the light is blinking, the Card is either in AP mode, or it is in Infrastructure mode and scanning for a network to link to.

Removing the ZoomAir Card

If you ever need to remove your ZoomAir Card, do not simply pull it from the PC Card slot. **It is not “hot-swappable.”** Follow the instructions below for your computer’s operating system.

Windows 95/98/2000: In your computer’s system tray, right-click on the PCMCIA device icon; then click the appropriate action to stop your PCMCIA device. If you don’t see this icon, go to **Start | Control Panel | PC Card (PCMCIA)**. Double-click on this icon, select your ZoomAir Card, and click **Stop**. After the Card shuts down, you may then pull the ZoomAir Card out of its slot.

Windows NT: You *must* first shut down the computer and turn off the power before you remove the ZoomAir Card.

Uninstalling ZoomAir

Follow these steps to uninstall the ZoomAir drivers and software.

- 1** Click on **Start | Programs | ZoomAir | Uninstall**.
- 2** To double-check that all drivers have been removed, point to **c:\program files\ZoomAIR** and verify that the ZoomAir folder is no longer there.

Next Steps

The next step, for both ad hoc and infrastructure networks, is for each client to determine whether it will share its printer, if any, and its files. Turn to **Chapter 3**.

You may also want to create a higher level of security for your wireless network. To do this, you need to change the network identification (Service Set Identifier, or SSID) for all clients and implement Wired Equivalent Privacy (WEP). **Chapter 4** covers these topics. If you have a simple two- or three-client ad hoc network in a private home or a small office, you probably already have all the security you need.

3

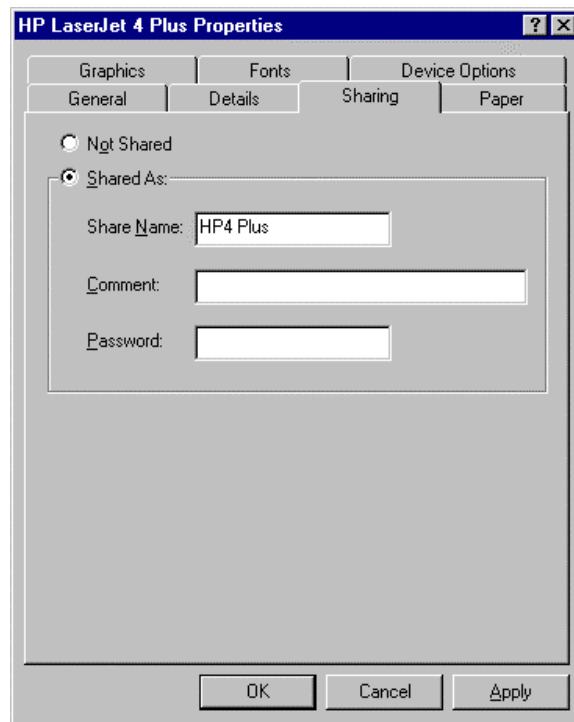
Sharing Printers and Files

The printer connected to any network member's computer, and the files on its hard drive, must be explicitly shared so that other network members can use them. This sharing is established through the Windows operating system on each computer.

Printer Sharing

When you share a printer, you allow others on the network to access that printer from their individual computers. To enable sharing, follow these steps:

- 1** Click **Start | Settings | Printers**.
- 2** Right-click on the icon for the printer you want this computer to share. Left-click on **Properties**. Click on the **Sharing** tab.



Click the **Shared As** radio button. You can change the name in the **Share Name** space if you want to. You can add a comment, which will appear in other network members' lists in **Network Neighborhood**. If you want everyone on the network to have access to this printer, leave **Password** blank. Otherwise, add a password (and write it down in a safe place), and tell those other network members whom you want to have access to the printer.

3

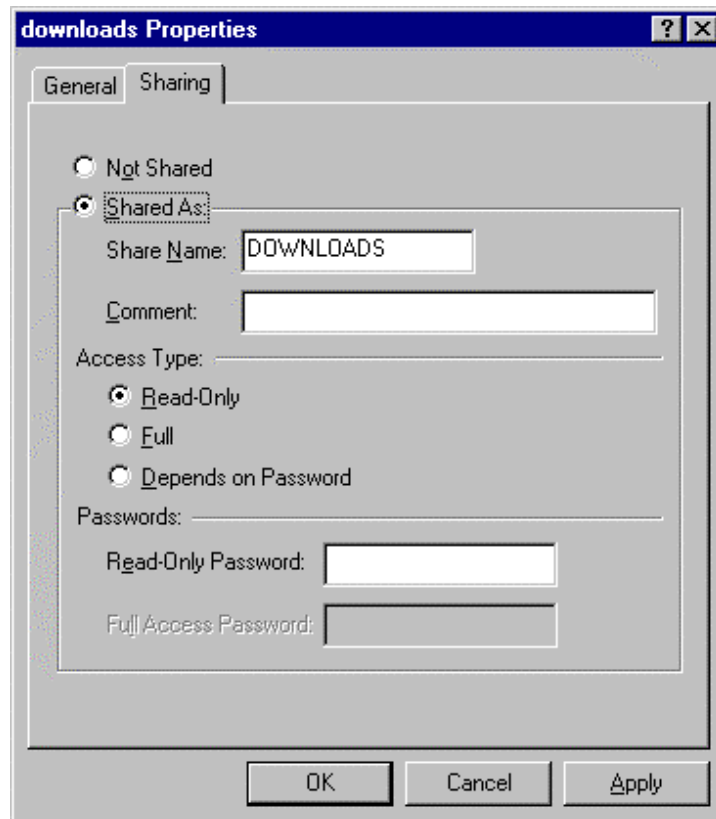
Click the **OK** button.

Important: Network members who want to share another member's printer must install the printer driver for that printer on their own computer. Consult the Windows Help file and the printer's own documentation for details

File Sharing

When you specify a folder or an entire drive to be shared, other members of your network will have access to the files inside it. Here are the steps for sharing files:

- 1 Click on **Start | Programs | Windows Explorer**.
- 2 Locate the drive or folder you want to share. Right-click on the icon and then click on **Sharing**.



Click on the **Shared As** radio button. You can change the name in the **Share Name** space if you want to. You can add a comment, which will appear in other network members' lists in **Network Neighborhood**.

3 Click on one of the radio buttons under **Access Type**:

- **Read-Only:** Network users will be able to look at the files and copy them to their own computers, but they will not be able to change, delete, or add files in the folder or drive.
- **Full:** Network users will be able to add, delete, and modify files in the folder or drive, just as though it were on their own computer.
- **Depends on Password:** Network users will have Read-Only or Full access depending on a password that you have entered.

4 In the **Passwords** section, you can enter a password for the kind of access you have indicated. If you have selected **Depends on Password**, you can have a separate password for each type of access. You can also leave the passwords blank if you want everyone to have access to the drive or folder.

Note: We strongly recommend against giving network members full access to another network member's entire hard drive. If you do, it is possible that someone may accidentally erase or overwrite an important file. You may initially want to create a special folder on each network member's computer into which he or she can copy files to be shared. As members become accustomed to using the network, they can share other folders.

5 Click **OK** to register the changes.

Full-Time vs. Part-Time Sharing

Any computer on any kind of network cannot share its printer or files if it is turned off. In homes and small offices, this usually isn't a problem: You just have to ask, "Please turn on your computer and printer so I can print this file"; "Please turn on your computer so I can read your report."

In larger organizations, you may find it desirable to keep one or more computers and printers running all the time, or at least during business hours. The computer with a shared printer is certainly

a candidate. If the computer also has a large hard drive, it could also serve as a repository for the major shared file folders. If a computer needs to be on but otherwise is not being used, you can turn off the monitor (or use its power-saving features) to minimize its power usage. Many recent printers also have a power-saving mode.

When each network member clicks on the **Network Neighborhood** icon, he or she will see the other members' computers. Clicking on a computer icon will display the folders and printers that have been shared.

Additional Information

You can get other useful information about file and printer sharing in the Windows Help file. Click on **Start | Help | Index** and type "sharing."

4

Changing Security Settings

A wireless network installed in a home or a small, stand-alone business is probably as secure as it needs to be. To eavesdrop on your network, an outsider would have to install identical ZoomAir wireless equipment, using only the default settings, and be within 300 feet of your network. To any other casual snoop, the spread-spectrum signal of a wireless LAN looks like random noise.

If you determine that you want additional security, ZoomAir provides two methods:

- *Changing the Service Set Identifier*
- *Implementing Wired Equivalent Privacy.*

Changing the SSID

The Service Set Identifier, or SSID, is simply the name of your wireless network. If you accepted the default SSID when you installed ZoomAir, it will be the same as the SSID on any other ZoomAir wireless network that was installed without changing the defaults.

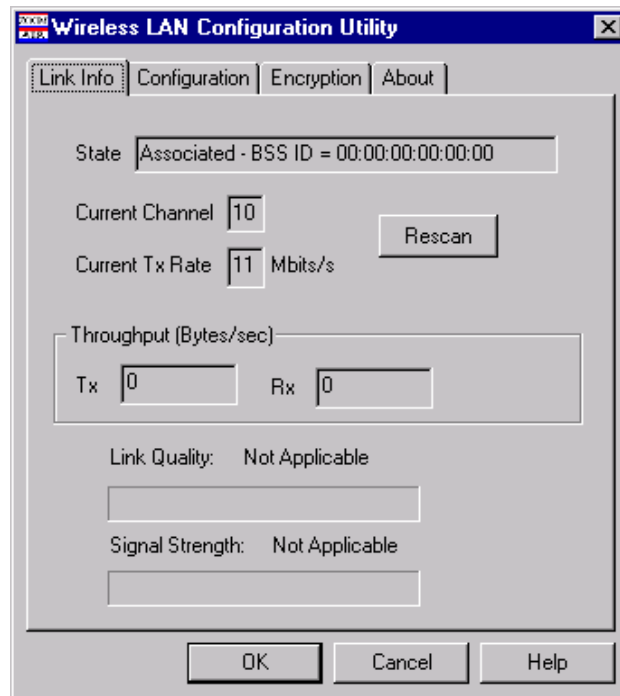
If you change your wireless network's SSID, no one without it can access your network to read or save your files, or print to your printer(s).

To change it, follow these steps:

- 1 The system tray (the area at the right side of the Windows taskbar) will contain an icon for the ZoomAir Card:

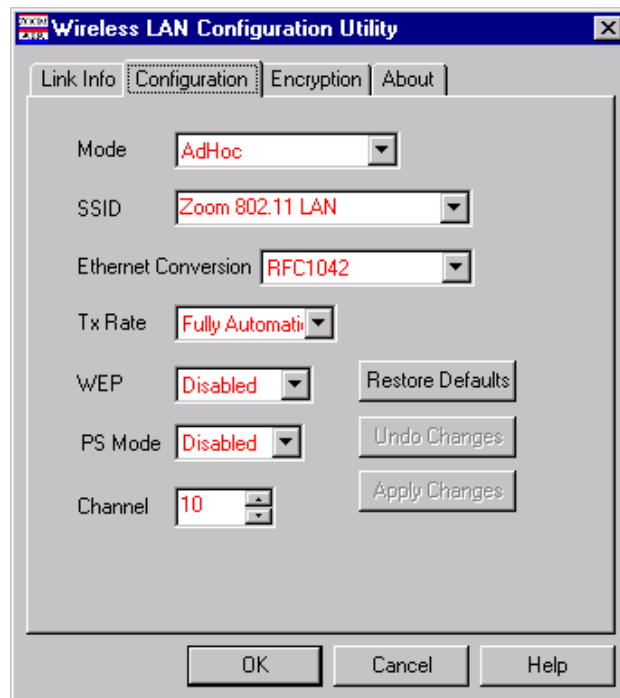


Click on it to display the **Wireless LAN Configuration Utility** dialog box.



- 2 Click on the **Configuration** tab. The following dialog box will display:

Note: Depending on whether you are using the ZoomAir Access Point software or a ZoomAir Client, your Configuration Utility may not display all the possible choices described here.



In the **SSID** space, type in a group name that will be shared by every member of your wireless network. *This identifier must be the same for all computers that will be on the same wireless network. It is case-sensitive. Members of your network should regard the SSID as a password and keep it secret.*

Tip: Many network administrators consider it good practice to change passwords occasionally. You may want to do this with your wireless network's SSID.

If you want to implement Wired Equivalent Privacy, leave this dialog box on screen; otherwise click on **Apply Changes** and then click **OK** to record the new SSID and exit the utility.

Wired Equivalent Privacy (WEP)

Although your ZoomAir wireless LAN is fairly secure using a unique SSID, you may desire an additional measure of security. The IEEE 802.11b standard includes provisions for software en-

encryption called Wired Equivalent Privacy, or WEP. WEP is a method of scrambling data before it is sent and reconstructing it as it is received. It offers a very high level of data protection, but at the cost of some speed on your wireless network. Most home networks and small offices don't need to implement WEP.

WEP addresses two concerns:

- Access to your network by intruders using similar wireless LAN equipment to become unauthorized members of the network.
- Eavesdropping on your wireless LAN traffic by capturing its radio signal.

WEP Access Control

WEP allows you to provide an electronic “key” to your network. It denies access to your network by anyone who doesn't have the key—much in the same way that outsiders are denied access to a locked building unless they have a key. Users of your network must exchange information about their current key before their computers are given access to the network.

WEP Eavesdropping Prevention

The WEP program generates a pseudorandom number for each packet of information it sends. The packet contents cannot be decoded without knowledge of the shared secret key.

How to Implement WEP

To implement WEP on your network, follow these steps:

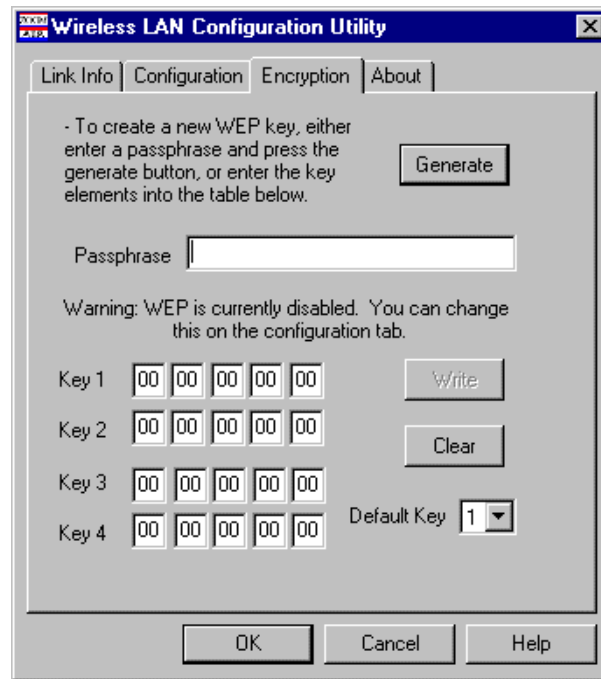
- 1 From the **Configuration Utility** dialog box, click the **Configuration** tab.

Then click on the down-arrow next to **WEP**:

- **Disabled**—Members will not have access to WEP-enabled members and vice-versa.
- **64-Bit**—Provides 64-bit encryption on your ZoomAir network.
- **128-Bit**—Provides 128-bit encryption on your ZoomAir network.

After you have made your selection, do not click **OK** yet, you still have to set the WEP key.

- 2** Click the **Encryption** tab. You will see the following dialog box:



The **Encryption** page lets you enter a Passphrase and then generates a multiple-part key. Follow these steps:

- Type in a passphrase. This can be any combination of letters, numbers, and spaces. It is case-sensitive.
- Click **Generate**. A series of keys will be automatically generated and displayed in the boxes below. You can also enter elements directly into the key table.
- Click **Clear** if you make a mistake and want to start over.
- Click **Write** to send the information to the computer's Registry.

You must repeat this process for all the computers on your wired network, and they must all have identical passphrases or keys.

Note: Be sure to record your passphrase in a place away from your computers. For security, the passphrase is not displayed in the WEP dialog box when you run the Configuration Utility again. If security is a significant issue for your network, you may want to change the passphrase periodically.

- 3** Click **OK** to exit the Configuration Utility.
- 4** Restart the computer for WEP settings to take effect.

5

Advanced Settings

We've designed the ZoomAir Card so that you can install it without having to customize any settings. If you accept the default settings for each Card you install, you should have a functioning wireless ad hoc network with no further work. If security is a concern, the few changes you make (following the instructions in Chapter 4) should be all that you need.

Note, though, that there are many more available ZoomAir settings to meet special needs or solve particular problems. If you would like to learn how to customize your settings, read this chapter. It takes you through the Configuration Utility one step at a time.

Running the Configuration Utility

Using the Configuration Utility, you can change the ZoomAir settings from the computer on which it is installed.

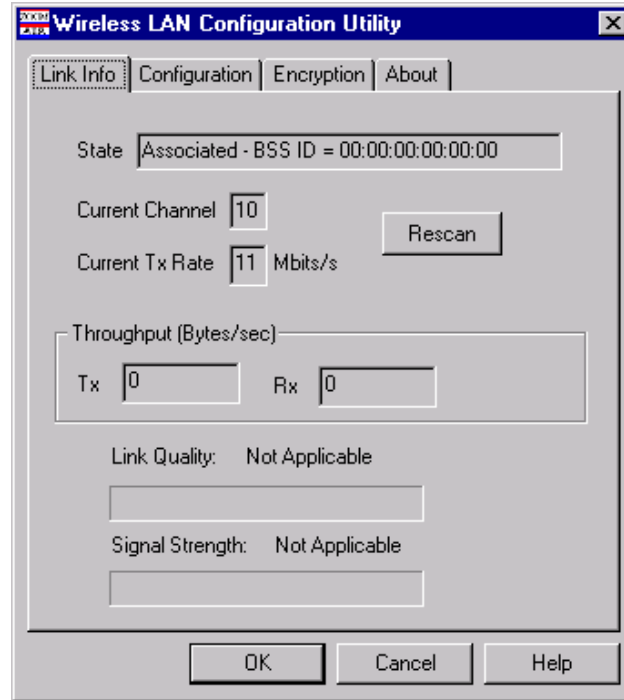
Note: For most settings, you must make sure to change *all* the ZoomAir Cards on the network to the same setting.

Follow these steps:

- 1 The system tray (the area at the bottom right side of the Windows taskbar) will contain an icon for the ZoomAir Card: it resembles a small monitor with an antenna sticking out the top. Click on this icon to display the following dialog box.

Note: Depending on whether you are using the ZoomAir Access Point software or a ZoomAir Client, your Configuration Utility may not display all the possible choices described here.

This is the first screen of the Configuration Utility.



The **Link Info** tab tells you whether this computer is linked to another computer on the ZoomAir network and provides information about that link.

State — Indicates whether the ZoomAir unit is linked to another unit on the wireless network.

Current Channel — Indicates frequency channel currently in use. All ZoomAir units on the same LAN must use the same channel.

Current Tx Rate — Indicates the data transmission mode of the ZoomAir Card; e.g., 11Mbits/s.

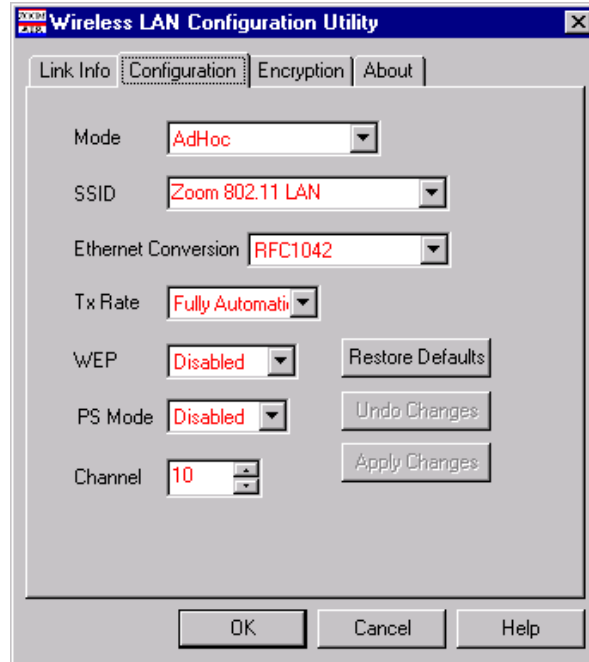
Rescan — Restarts your ZoomAir unit.

Throughput — Indicates the number of bytes per second your unit is transmitting (Tx) and receiving (Rx).

Link Quality and **Signal Strength** — Indicates (by the length of the color bar) how well your ZoomAir unit is performing as a client on an Infrastructure network. For ZoomAir units in an

ad hoc network or a ZoomAir unit serving as an access point, these bars will be blank.

2 Click on the **Configuration** tab. See the following illustration.



The **Configuration** tab lets you change the basic settings of the ZoomAir Card. If you've already changed security settings in Chapter 4, you've probably changed the **SSID** and the **WEP** setting. Unless conditions on your wireless network have changed, you shouldn't need to modify these settings.

Mode — Indicates how your ZoomAir product should be configured. These are your choices:

- **802.11 AdHoc** (default). In this mode, the computer is set up to operate in a client-to-client, or peer-to-peer, network, 2 Mbps and 11Mbps clients.
- **AdHoc** means that the computer is set up for backward compatibility with other vendors' earlier 11Mbit cards and can communicate with them peer-to-peer.
- **Infrastructure** means that the computer is set up to operate in a client-to-access point network.

- **AP** means that the computer is set up to operate as an access point via the ZoomAir Access Point Software.

SSID — The name of the wireless section of your LAN; e.g., **Zoom 802.11 LAN** is the default. ***This name must be the same for all ZoomAir units on your network.***

Ethernet Conversion — The method by which the wireless computers communicate with each other. Accept the default of **RFC1042**.

WEP — Enables or disables Wired Equivalent Privacy.

- **Disabled**—Members will not have access to WEP-enabled members and vice-versa.
- **64-Bit** — Provides 64-bit encryption on your ZoomAir network.
- **128-Bit** — Provides 128-bit encryption on your ZoomAir network.

For specific settings of WEP, click on the **Encryption** tab.

PS (Power Saving) Mode — Not currently supported.

Channel — All ZoomAir units on the same LAN must use the same channel. In an Infrastructure network, the access point changes the channel dynamically.

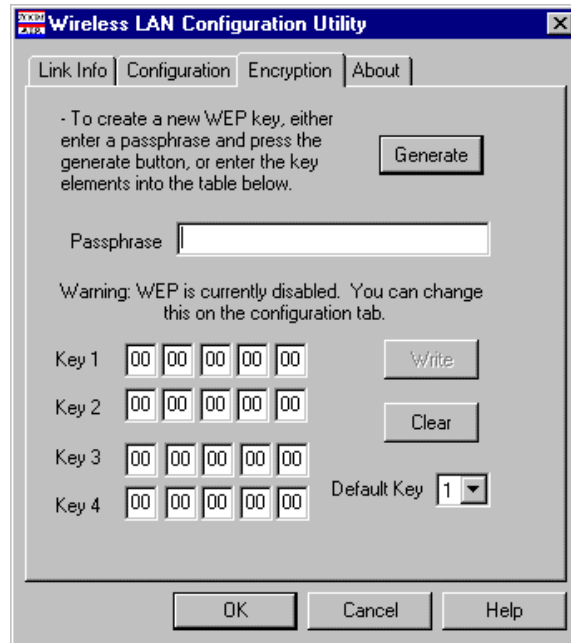
In an ad hoc network, the first machine powered up sends out a beacon and controls the channel. Unless you encounter interference from an adjacent wireless LAN, you shouldn't need to change the channel. The most straightforward way to ensure that all units use the same channel is to change all of them manually.

Restore Defaults — Restores the ZoomAir unit to the settings it had when it was first installed.

Restore Initial — Restores the settings to the last state that was saved to the ZoomAir unit.

Apply Changes — Saves new settings to the ZoomAir unit.

3 The **Encryption** tab displays settings for Wired Equivalent Privacy (WEP):



See the instructions in **Chapter 4** for creating a WEP key.

- 4** The **About** tab displays the version and release date of the Configuration Utility. It also displays the version of the ZoomAir driver. You may need this information if you ever need to call Technical Support.

Appendix A

For Desktop Users Only: Installing the PCI Adapter

Because most desktop computers don't have a PCMCIA slot, we offer a ZoomAir model that includes an adapter board that is compatible with a desktop computer's PCI slot. If you've purchased this model, you can use your ZoomAir Card in your desktop computer as well as in your laptop. Note that this adapter provides a PC Card slot only for the ZoomAir Card; it is not intended for any other types of PC Cards.

Note to Windows NT users:

At this point, you want to install (or reinstall) the latest NT Service Pack. This ensures that all Service Pack files are current or have been restored to the latest version

Note: You must install the PCI drivers first, before the board.

Installing the PCI Drivers

Follow these steps to install your PCI adapter drivers.


- 1** Insert the **ZoomAir CD** into your computer's CD-ROM drive, run **d:\setup** where **d** is your CD-ROM drive, and click **Next**. When the **ZoomAir High Rate Wireless Networking** screen appears, click the **PCI Adapter** button. The drivers will be installed automatically; just follow the prompts.

Note: By default, the PCI drivers will be installed on your computer's **c:** drive.

- 2** Upon completion, you will be prompted to restart your computer. **You should completely shut down your computer.**

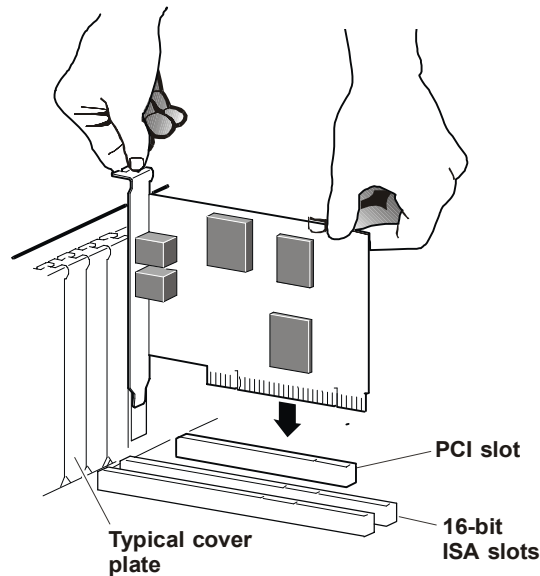
Now continue below to install the PCI adapter board.

Installing the PCI Adapter Board

Electrostatic Discharge Protection	
	Static electricity can damage components on your internal card or inside your computer. Before removing the board from its antistatic bag, touch the computer's metal chassis to statically discharge yourself.
CAUTION	

Follow these steps to install your PCI adapter board:

- 1** Your computer should already be shut down. If not, do so now. Don't restart it until you've completed the hardware installation.
- 2** Take the cover off your computer. You will probably have to remove several screws on the back of the case; most likely, they are near the outer edges.
- 3** Remove the adapter board from its antistatic bag. It is designed to slip easily into the PCI slot. See the following illustration:



Be sure that the bracket is lined up properly, then screw the bracket into the computer using the screw you removed with the cover plate. Be sure that the back end of the board (smaller gold finger area) is properly seated into the connector. If you have a tower or mini-tower computer with a vertical main board, you may want to lay the computer down on its side so you can push straight down on the board to seat it firmly in its slot.

The Final Step

If you are a Windows NT 4.0 or Windows 2000 user:

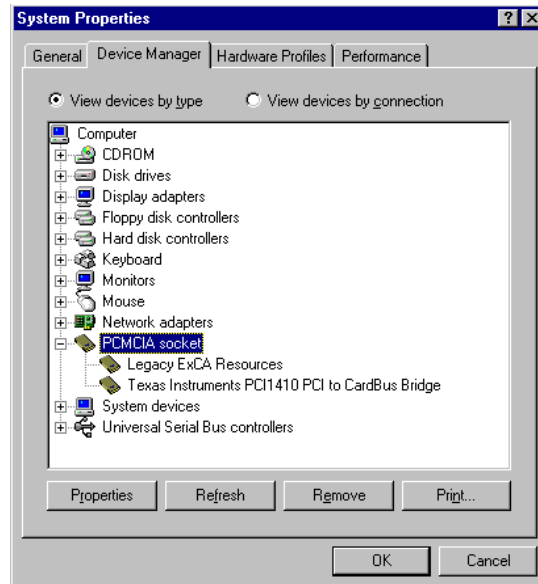
Your PCI adapter installation is done. Return to **Chapter 2** on page 17 to install the ZoomAir Card.

If you are a Windows 95 or 98 user:

You **must** follow these steps to verify that the Legacy ExCA Resources PCMCIA socket has been installed.

- 1** Restart your computer.
- 2** Click **Start | Settings | Control Panel**. Double-click the **System** icon. The **System Properties** dialog box will display. Click the **Device Manager** tab. Under **PCMCIA socket**,

you should see **Legacy ExCA Resources** listed. See the following illustration.



If you do not see this device listed, your PCI Adapter installation was not successful. Contact Technical Support.

- 3 Once you see **Legacy ExCA Resources** listed, you can return to **Chapter 2** on page 17 to install the ZoomAir Card.

Appendix B

Answer File Installation Instructions

The ZoomAir Answer File is an added feature for those administrators who are installing a large wireless network. Instead of going through an individual installation process for each computer, you can create an answer file that automates the installation and minimizes the need for user input.

To use the answer file to configure your specific installation, run **d:\ZoomAir\setup.exe /A=a:\usrans.txt** where **d** is the location of the CD-ROM drive, **a** is the location of the answer file to be used, and **usrans.txt** is the name of your answer file.

Important: The answer file must be in *.txt format.

KEY_TEXT	VALUE	DESCRIPTION
TARGET_DIRECTORY_PATH	DEFAULT_PATH	The InstallShield default target directory path will be used: C:\ZoomAir.
	<String>	Installation path.
	NULL	The user will be prompted for the target directory path.
INSTALL_TYPE	AP_INSTALL	The access point installation will begin.
	CLIENT_INSTALL	The client installation will begin.
	NULL	The user will be prompted as to which installation type to use.
START_MENU_FOLDER	DEFAULT_FOLDER_NAME	The InstallShield default's start menu folder name will be used: ZoomAir.
	<String>	If the value is a valid string, it will be used for the start menu folder name.
	NULL	The user will be prompted as to which start menu folder name to use.

NET-WORK_TYPE	Ad Hoc	This will install an ad hoc client.
	Infrastructure	This will install an Infrastructure client.
	Access Point	This will install an access point.
	NULL	The user will be prompted as to what type of network to install.
SSID	<String>	An alphanumeric string that will be used as the SSID.
	NULL	The user will be asked either to enter an SSID or to accept the default: Zoom 802.11 LAN.
TCP/IP	Yes	The TCP/IP protocol will be installed (if it isn't already).
	No	TCP/IP will not be installed.
	NULL	If InstallShield does not detect TCP/IP as present, it will ask the user if the intent is to access the Internet from this PC. If the user answers yes, TCP/IP will be added to the Network Control Panel . If the answer is no, TCP/IP will not be added.
IPXSPX	Yes	The IPX/SPX protocol will be installed (if it isn't already).
	No	IPX/SPX will not be installed.
NETBEUI	Yes	The NetBEUI protocol will be installed (if it isn't already).
	No	NetBEUI will not be installed.
	NULL	NetBEUI will not be installed.
VSERVER	Yes	File and printer sharing will be installed (if it isn't already).
	No	File and printer sharing will not be installed.
	NULL	File and printer sharing will not be installed.
CON-TINUE_IF_EXIS-TING_INSTALL	Yes	The installation will continue (or will over-write the existing installation) without any additional user prompting.
	No	An error message will display, stating that a previous installation has been detected and that the user should uninstall ZoomAir before re-installation. Install will then abort.
	NULL	The user will be prompted that an existing install has been detected and that it should be uninstalled first. If the user answers yes, the install will continue; if the answer is no, the install will abort.
IP_ADDRESS	<Value>	Valid IP address.
	NULL	If this is a client installation, the PC's IP address will not be modified; if it is an access point install, the access point's NIC card values will be used.

IP_MASK	<Value>	Valid IP mask. The IP mask string should take the following form: 255.255.255.0.
	NULL	If this is a client installation, the IP mask will not be modified; if it is an access point install, the access point's NIC card values will be used.
DE-FAULT_GATEWAY	<Value>	If a valid IP address is entered for a gateway, this value will be inserted into the appropriate binding.
	NULL	If this is a client installation, the default gateway will not be modified; if this is an access point install, the access point's NIC card values will be used.
RUN_BEFORE_END	NULL	Nothing will run after the Finish Dialog box is displayed.
	non-NULL	A command to run after the install is completed but before the Finish Dialog box is displayed.
DS_CHANNEL	<Value>	Valid channel number.
	NULL	Channel will default to 10.

Appendix C

Troubleshooting

This section describes easy troubleshooting tips that may help you avoid a call to Technical Support. The most common problems with wireless networks are likely to involve conflicts with machine resources—IRQs, for example. Another common problem is that sharing has not been set up correctly (see Chapter 3). And perhaps the most obvious and easiest aspect to overlook is that the networked computers aren't running.

You should also check out the ZoomAir FAQ section of our web site: www.zoomtel.com/zoomair/zafaq.shtml.

All or part of your ZoomAir Wireless LAN is not working at all. First check that all of the ZoomAir Cards are properly installed.

- If you are running in infrastructure mode, make sure the Access Point is running.
- The ZoomAir client software must be installed on each computer. (It should not be installed on the Access Point.)
- The ZoomAir Card must be plugged into the PC Card slot built into the computer or into the PCI Adapter board.
- The network control panel on each computer must be set up with file and printer sharing for Microsoft Networks, Client for Microsoft Networks, and the protocol used by the network.
- The ZoomAir Card on each computer must be configured for the network type (ad hoc or infrastructure). All network must have the same Workgroup name and SSID.

The network seems to be set up and operating correctly, but some members do not show any shared folders or printers.

- Each member of the network controls what can be shared. If a member hasn't set up a folder or printer for sharing, nothing will show up in Network Neighborhood beyond the icon for that computer.

One or more members of the network are still not showing up in Network Neighborhood and are not linked to the network even though they are properly installed.

- It can sometimes take several minutes for a network member to show up in Network Neighborhood, especially the first time Network Neighborhood is accessed. (This is true of all networks, not just wireless networks.) If you know the name of the computer you are looking for, try clicking on **Start | Find | Computer** and entering the name of the computer to confirm the link.
- The computer in question may be out of range of one or more other members of the network. Nominal range of the ZoomAir Card is 300 feet indoors. This range can be affected by building construction (thickness of walls, use of metal framing, etc.). Experiment with locations to see if this solves the problem. Sometimes even a minor shift in location or orientation can do the trick.
- If you cannot relocate ad hoc network members so that they are close enough, consider converting one of the desktop computers, if it is centrally located with respect to the other members, to an access point. You would also need to change the network to an infrastructure network through the ZoomAir Configuration Utility. An access point, even if it isn't connected to a wired LAN, can extend the range of your network by acting as a repeater for the wireless members.

Data transfers across the network seem very slow.

- Data transfers over any LAN, wired or wireless, are slower than data transfers within a computer (for example, the hard drive). A slight delay in LAN data transfers is normal.
- If data transfers with one or more of the network members is noticeably slower than the rest, that member may be close to

the limit of its effective range. Data sent over networks is broken down into smaller units called packets. The networking software checks the packets in different ways and may request that missing or damaged packets be re-sent. As the radio signal becomes weaker, more packets are re-sent and apparent speed declines. The solutions are the same as for the previous problem: Relocate the computer(s) or establish an access point. A minor change in computer location can sometimes result in dramatic improvement.

- If all transfers seem abnormally slow, there may be another nearby wireless LAN on the same or an adjacent channel. This is unlikely given the limited range of wireless LANs, but it may be worth checking out if your network is in an office or apartment building likely to contain computer networks. Try changing to a different channel to see if transfer speeds improve (see **Chapter 5**).
- The amount of traffic and the number of members on a LAN can affect its speed. An ad hoc network has a theoretical limit of 128 members; in practice, it can become unwieldy beyond 5 or 6 members, depending on the amount of traffic. If your wireless network is larger than (or expands beyond) about 6 members, you should consider an infrastructure network.

You have installed Internet gateway software such as SyGate on one computer in the network, and network members are sharing one Internet account with an Internet Service Provider. The Internet connection sometimes seems very slow.

- Internet sharing software allows the Internet connection to be shared, not multiplied. If several members are surfing Web pages or downloading files at the same time, each member's speed will be slow. Solutions include dividing the network into independent segments (through SSIDs and channels) and providing a second Internet connection; upgrading to a faster means of Internet access (ISDN, xDSL); or using modem "teaming" or "bonding" software, an additional telephone line, and a second modem.

Your wireless LAN's performance has been fine until recently; then performance deteriorated rapidly.

- Double-check all installations and settings. Some members may have been experimenting with the network or may have installed communications software that affected the network settings.

Appendix D

Regulatory Information

FCC Part 15 Emissions Statement

All wireless LAN devices generate radio frequency energy and if not installed and used properly, i.e., in strict accordance with these instructions, may cause interference to radio and television reception. This device has been tested and found to comply with the limits for a Class B Computing Device in accordance with the specifications in Subpart B of Part 15 of the FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, try to correct the interference by one or more of the following measures:

- Relocate the receiving antenna.
- Relocate the device with respect to the receiver.
- Move the device away from the receiver.
- Plug the device into a different outlet so that the device and receiver are on different branch circuits.
- If necessary, consult the dealer or an experienced radio/television technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

FCC Warning

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Part 15 C Statement

This equipment is approved under Subpart C of FCC Part 15, under the FCC Identifier BDNWLNPCCARD11.

Department of Commerce End User Statement

This item falls under the jurisdiction of the Department of Commerce, and as such, the requirements set forth in section 740-17 of the Export Administration

Regulations must be complied with. See the following Web sites for more information:

- ❑ Bureau of Export Administration
http://www.bxa.doc.gov/DPL/2_denial.htm
<http://www.bxa.doc.gov/Entities/>
- ❑ Code of Federal Regulations
http://www.access.gpo.gov/bxa/ear/ear_data.html

Federal law prohibits the sale or distribution of certain products to certain individuals and organizations. Denied persons or organizations may not, directly or indirectly, participate in any way in any transaction involving any commodity, software, or technology exported or to be exported from the United States that is subject to Export Administration Regulations. The above Web sites provide a detailed list of individuals and organizations that have been determined to present an unacceptable risk of diversion to developing weapons of mass destruction or missiles used to deliver those weapons.

Declaration of Conformity

The manufacturer declares under sole responsibility that this equipment is compliant to Directive 1999/5/EC (R&TTE Directive) via the following standards:

Standards

EN 60950
EN 55022
EN 61000-4-3
EN 61000-4-2
ETS 300 328
ETS 300 826

The product is CE Marked.

Intended Use

The intended use for this RLAN equipment is operation in the 2.4GHz frequency band.

Important Information

We recommend that you take a few moments to fill in the following information for future reference. In the event you need to call Technical Support or Customer Service, you'll need the information below.

ZoomAir Model

(located on the box)

Serial Number

(located on the ZoomAir Card)

**Serial Number of PCI
Adapter**

(located on the bracket or the board)

MAC Address

I/O Range and IRQ

Date of Purchase

Store or Dealer
